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ON THE SEXUAL ORIGIN OF THE NIDIFICATORY,  
INCUBATORY, AND COURTING DISPLAY IN-  
STINCTS IN BIRDS: AN ANSWER TO CRITICISM.

By EDMUND SELOUS.

THE 'Zoologist' for June of last year contains a contribution—viz. "Notes on the Courtship of the Lapwing"—by Miss Maud D. Haviland, which I did not read till a long time after it had appeared. In it the writer comments, forgetfully, on some observations made by myself on these same activities, which were also published in the 'Zoologist' fifteen (not "ten") years before the above-mentioned date, and also criticises certain suggestions made by me in explanation of actions the true nature of which had not been, up till then, and is not, I think, now fully realised, but which of itself, as it were, and automatically, throws new, or rather, perhaps, the first light on the origin of courting display in birds. This part of the subject, however, I must perforce neglect, owing to the small space at my disposal. What I shall have to say will relate principally to the first, and, in a fair degree, also, to the second, of the three instincts specified in the title. On p. 220 of the paper referred to Miss Haviland thus comments on my note on the "rolling," as I have called it, of the female, as well as the male Peewit:—"If his discrimination" (of the sexes) "is correct (and Mr. Selous will pardon any implied doubt) his record is of much interest." I can resolve all reasonable doubt, as follows: My attention

was confined to two birds, and two only, nor were there any others in their immediate neighbourhood. Therefore, if I saw them both roll—which I did—then both the male and female rolled, if the two were male and female. But the two had just paired: therefore they were male and female. One of them rolled first. Almost certainly this one was the male, but, to quote my conscientious text:—"I am not quick enough with the glasses to be quite certain." The other (and it was certainly the other) then rolled also in the less pronounced manner which I have described.\* The doubt then is not whether the female rolled, but whether she rolled more or less vigorously than the male in this instance. Discrimination is a great matter—but so is context. In the same conclusive way I have shown† that the female Peewit not only, on occasion, rolls, but that she also goes through the same specialised pecking or picking-up actions as the male. Essentially, therefore, all of what the male does, as a result of which we have a circular depression with grass-stems laid on it‡—a nest, in short, in structure, if not in function—the female does also, in kind if not in degree, and moreover (this is the specially important point in my observations) the two birds act thus, in partnership, under a common stimulus which either *is* the pairing, or includes that in its effects, and is therefore certainly sexual. It is, therefore, a legitimate conclusion that the nest itself has arisen out of these actions, common to both the sexes. Miss Haviland is mistaken in supposing—as she appears to suppose§—that I attribute the part played by the hen to imitation merely. To argue on an assumption is not to accept the assumption.

I shall show later that bi-sexual action, of the "antic" kind, in birds is not so infrequent as Miss Haviland is under the impression that it is,|| and that in saying that I do not give any other examples of it than that of the Peewit,¶ she is—unless this refers only to my paper specially on that bird—much

\* See (for full confirmation of above) 'Zoologist,' April, 1902, pp. 136, 137; also 'Bird Life Gleanings,' pp. 164, 165.

† 'Zoologist,' pp. 136–7.

‡ See *post*, p. 406.

§ 'Zoologist,' pp. 224–5.

|| *Ibid.*, p. 223.

¶ *Ibid.*, pp. 223–4.



mistaken.\* The fact that, speaking generally, such action is more developed in the male does not, in my opinion, tell against my view, for when Miss Haviland says :—"It is not likely that the necessity for amatory exercises, as a way for working off emotions, should have lapsed in one sex and not in the other, especially when the resultant passion to make a nest has persisted so strongly,"† I am quite unable to follow her. I think it is what, *prima facie*, one might have expected, on the principle of specialisation and division of labour as brought about through natural selection, which would have preserved the "resultant passion," because useful, whilst letting the steps that had led to it lapse because, being no longer so, they now represented waste energy or energy in excess of the bird's capacity. Some check on expenditure there must be, and Nature's retrenchments would be upon the same lines as our own.

And what is meant here by "necessity"? Things are only necessary, in evolution, till replaced by other things more necessary—*i. e.* more beneficial—*pro tem.* Marvellous instances of this lie before us. The female instincts and organs must once, in every case, have been necessary for the female ant, but they have gone, to make her the worker ant. How much more easily then, might anticking female birds have been turned into non-or less anticking nest-building ones. Also the "amatory exercises," assumed by Miss Haviland to be necessary, may not even be of importance. They may be—and very likely are—no more than a by-product, which, as long as it were not detrimental, might continue indefinitely, offering good raw material for natural selection to seize on and make something useful out of. Many of the fine things of higher human nature—romantic love, for example—are but by-products in respect of Nature's main scheme of advance, but, being compatible with it, they go on, and we go on thinking too much of them.

Miss Haviland does not think that the cock bird often helps the hen in nest-building, and her opinion, in regard to exceptional facts, appears to be that they mean nothing and point nowhere.‡

\* See *post*, pp. 406 (3), 407 (6) (10), 408 (14). I can, however, owing to the exigencies of space, only give marginal references to this and other facts essential to my argument, and supporting the statements in the text.

† 'Zoologist,' p. 223.

‡ *Ibid.*, p. 225.

This to me seems grotesque. The significance of a fact does not lie only in its frequency, and Darwin himself would have been very much hampered in his reasoning could he have drawn no conclusion from cases of survival, reversion, or other anomaly, till they had been proved to outnumber those in which no such departure occurred. But, in the first place, there is another class of assistance, besides that of nest-building, which the male bird may render the female—incubation namely—and, in so far as my theory (with which Miss Haviland does not appear to have made herself entirely acquainted) is concerned, the one kind is as pertinent to the argument as the other, since I suppose that there was, first of all, the pairing-place, merely, which became the nest by reason of the eggs being laid there and incubated owing to their having been laid there—all this independently of whether structure, even of the most primitive kind, had yet supervened. Why, indeed, should the male bird help to incubate eggs, not his own, any more than he should help to make a nest for those eggs? In my view, both these effects, as well as that of true courting display action, grew out of the same ultimate cause, viz., the sexual spur.\* They are, in this connection, parts of one whole, and therefore, for me, the inferences to be drawn from the co-operation of the male, in either of these two functions, are alike. It is, of course open to Miss Haviland to show the fallacy of my inferences either in the one or the other case, or both, but she must not rob me of half my material, whilst running away from the other half, on the ground of its being exceptional—as to which let us see.

What, then is the proportion of species in which the male bird helps the female, either in building the nest or in incubating the eggs, to those in which he shares in neither? Here to some extent is the answer. Out of 212 species of birds that are mentioned in 'The British Bird Book' as breeding, either habitually or occasionally, in these Islands, the details on this head, given in the "Classified Notes," are as follows: In 63 species out of the whole 212, the male bird assists the female both in nidification and incubation. In 13 species he assists her in nidification, but whether he does in incubation also is

\* Incubation, however, more incidentally and less genetically than the other two. See *post*, p. 408 (11) and (12) with marginal references.

uncertain. In 9 species he assists her in nidification, but not in incubation. In 56 species he takes part in incubation, but it is uncertain whether he does so also in nidification; and in 43 species he helps to incubate only. In 28 species the male is stated neither to build nor to incubate, and as 22 of these belong to either the Duck or Pheasant families, whilst the Ruff and Great Bustard are included in the other 6—all great displayers—we can understand this on the principles already adverted to. Also, through the law of reversion, but not very easily otherwise, we can understand why the male Pheasant (as the best known) has sometimes been known to incubate.

There are thus left 39 species where the participation of the male either in one way or the other, is doubtful, but as more than half of these are more or less rare birds, and the greater number of shy, retiring, or nocturnal habits, it is obvious that a fair proportion of them (since there is not the precedent reason against it) will in time be added to the affirmative list.

Let us, however, take certainties only, or what, within a moderate margin, may be assumed to be such. There are 173 species in which the part played by both sexes, in the matters under consideration, is given as ascertained, and in 145 of these the male assists the female either in incubation or nidification, or both. That is a proportion of more than five-sixths. Where the assistance is in nidification only, the number given is 85—practically half—and where it is confined to incubation, 123, which is nearly three-quarters. The supposed exceptions, therefore, outnumber the supposed rule. How is this to be accounted for? Have large numbers of male birds acquired certain domestic habits which did not originally and naturally belong to them, but only to the female? Or were such habits—once common to both the sexes—lost by many males, in the course of evolution, owing, as we may surmise, to the advantages derived from division of labour, differentiation, and the economy of force—Malpertuis' law of "least action?" If the instincts which give rise to these habits have, as I hold, been evolved out of the primary sexual one, then, as this came first and is universal, the second of these suggested explanations would seem to be the more probable. What is the direct evidence? I have, at various times, observed and recorded certain facts in the nuptial

and domestic life of birds, which, with some others that I have on authority, seem to me to point to the conclusion that the said instincts, as set forth in the title of this paper, have been so evolved. These facts may be summarised under the following headings (where not otherwise indicated, the references are to my own observations) :

(1) The picking up and letting fall again, or placing in such a spot as is commonly chosen for the nest, of materials used in making the nest, by the male bird, together with other more or less marked actions, or as part of a general behaviour, due to sexual excitement; this either in the presence or absence of the female, during the earlier part of the breeding season, before the actual nest has been begun or even the actual mating settled.\*

(2) The further fact that as a result of such sexual actions as a whole, or of some of them, something more or less closely resembling the nest of the species is actually made by the male bird.†

(3) The participation of the female in these and other sexual actions and movements of the male, inclusive of the true courting display, into which they gradually pass.‡

\* 'Bird Watching,' pp. 71-2. 'Zoologist,' April, 1902, pp. 135-7, 142-3. 'The British Warblers,' H. E. Howard, vol. i, 2, pp. 6-7, with plate facing p. 6; 4, p. 9, with plate facing p. 9; 5, p. 10: vol. ii, 23, p. 8, with plates facing pp. 10 and 12; 25, pp. 18, 14, with plate facing p. 11; 26, p. 5, with plate facing p. 4; 20, p. 41.

† 'Zoologist,' April, 1902, pp. 138-9. "Birds of the Breck," W. Farren, and "The Woodlark in East Berks," E. E. Pettitt, in 'Wild Life,' June, 1915, pp. 164, 170. As more recently observed by me, the circular depression in the ground made by the male Peewit is sometimes lined.

‡ 'Zoologist,' April, 1902, pp. 136-7; May, 1902, pp. 196-7; September, 1901, pp. 343-4; May, 1907, pp. 168, 169; May, 1912, pp. 179-80; June, 1912, p. 213; February, 1914, pp. 63, 66. 'Wild Life,' March, 1914, p. 143; April, 1914, pp. 206-7, 209-11; May, 1915, pp. 151-2; February, 1916, pp. 51, 53-4. 'Bird Watching,' pp. 18-20, 42-3. 'Bird Life Gleanings,' pp. 164-6, 288, 'The Bird Watcher in the Shetlands,' pp. 125-31. 'The British Warblers' (H. E. Howard), vol. i, 5, pp. 8, 10, with plate facing p. 10; 12, pp. 17, 18, with plate facing p. 30; 14, p. 17, with plate facing p. 16; 15, pp. 13, 14, with plate facing p. 12: vol. ii, 21, pp. 35-6, with plates facing pp. 32, 34; 25, plate facing p. 18; 26, p. 5, with plate facing p. 6. The 'Scottish Naturalist' ("The Display of the Mallard," S. E. Brock), April, 1914, pp. 79-80. The list includes 23 species, representative of 8 orders, 5 sub-orders, and 14 families.

(4) The actual building by the male bird, before the arrival from overseas of the female, and in a state of sexual excitement, of a nest, which, upon her arrival, she helps to finish, and in which the eggs are then laid and incubated.\*

(5) The building by the male, after the arrival of the female, of one or more nests, previous to the participation of the latter in the work, when, by the joint efforts of both, a final one is made in which the eggs are deposited.†

(6) Actions of the female bird in nest-building, curiously resembling some sexual actions of the male of another and widely separated species, as a consequence of which similar actions, an essentially similar result, in the case of the real and the so-called "false" or "mock-nest," is produced.‡

(7) Coition on the nest, either (apparently) invariable, or more or less habitual, in the case of various species of birds, representing (as observed by myself) three orders.§

(8) The catching up by the female of some part of the material of the nest thus used as a pairing-place, either during or immediately after coition, whilst—in the first case certainly, in the second inferentially—in a state of sexual excitement.||

(9) Actions, similar to the above, of the female, whilst sitting alone, on the nest thus used, awaiting or pending the return of the male, to repeat the act of coition.¶

(10) The apparent association, in the mind of both the male and female bird, of nidification and coition, as shown by (a) the former activity either immediately preceding or succeeding or even traversing, and, to some extent, impeding the latter; and (b) the act of taking up in the bill such material as is used in making the nest, even when the birds thus acting are at a distance from and out of sight of it, having become, with them, a symbol of conjugal union on the nest, as shown by its being

\* 'The British Warblers,' H. E. Howard, vol. i, 1, p. 8, with plate facing p. 13.

† 'The British Warblers,' vol. i, 1, pp. 11-13.

‡ 'Zoologist,' April, 1902, pp. 140-1.

§ 'Zoologist,' May, 1901, pp. 162, 181; September, 1901, pp. 341, 345; June, 1914, pp. 224-5. 'Wild Life,' April, 1914, pp. 211-12; June, 1915, pp. 177-8; July, 1915, pp. 31, 34; August, 1915, pp. 41-2.

|| 'Zoologist,' June, 1914, p. 216; 'Wild Life,' June, 1915, p. 178.

¶ 'Wild Life,' April, 1914, p. 212.

immediately, and with a special impetus, followed by a resort to the nest, for that purpose.\*

(11) The lengthy sojourn of the female on the nest, during which, visits are made by the male for the purpose of coition upon it, this taking place either (a) before any of the eggs have been laid, as observed, or (b) after one or more of them have been laid, as inferred from the conduct of the birds, in preparation for this act; these facts suggesting possible stages through which the earlier use of the nest, as a pairing-place, has passed into the later one, and incubation, owing to the presence of both parents, in contiguity with the eggs, become common to both, a fact which, seeing that they are only laid by one of them, one would not, *prima facie* expect to find in any case.†

(12) The habitual daily presence, during considerable periods of time, of both the male and female bird, on a certain spot where pairing takes place, and where the nest is subsequently gradually built, with continuance of such pairing upon it, thus greatly strengthening the above surmise.‡

(13) Reversed functioning as between the sexes, *in coitu*, suggesting the essential oneness, in both, of the sexual feelings from, or in connection with which, all sexual movements, antics, etc., must have originated; which makes it easier to suppose that any transforming process of evolution in such movements, in any direction, has been essentially the same in both, as also that any of them may have passed from one sex to the other, with consequent increase, decrease, or cessation of the activities thus transferred, in either, according to the ordinary law of the utilisation of beneficial variations, through natural selection.§

(14) The recurrence of sexual actions and movements, including those of true courting display, such as ordinarily precede coition, immediately after this has taken place, on the

\* 'Zoologist,' September, 1901, pp. 343-4; June, 1914, pp. 213-14.  
'Wild Life,' June, 1915, p. 178; July, 1915, pp. 32-4; August, 1915, pp. 38-9, 41-2.

† 'Zoologist,' May, 1901, pp. 162-5; 'Wild Life,' April, 1914, p. 212.

‡ 'Wild Life,' May, 1915, p. 153; June, 1915, pp. 177-8. The facts are brought out more fully in my actual notes (unpublished), of which the paper is a *résumé*.

§ 'Zoologist,' September, 1901, pp. 341-2; May, 1902, pp. 196-7; May, 1907, pp. 168-9. 'Wild Life,' July, 1915, pp. 31-5; August, 1915, pp. 38-42.

part not only of the male, but, in some cases, of the female also, suggesting an association of ideas, in the minds of both, as between this act and the actions and movements in question, through some of which latter, as has been seen, the so-called "false" or "mock nest" of the male is produced. The question also arises whether the nidificatory activities, as well as the courting display actions of birds, may not have originated in such actions as these, thus occurring, whatever the reason, as after-effects of the act of coition.\*

The suggestiveness of the above facts—the great mass of which stand in an actual and not merely an implied relation to (a) the construction of the nest, and (b) a certain earlier use of it than the widely different one, to which it is commonly put—is sufficiently obvious. They lie on the threshold of any inquiry into the origin of the nest-building instinct in birds. They cannot be ignored, they have to be accounted for. My theory accounts for them, binds them, as it were, together, and makes an understandable whole of them. Therefore it is incumbent on any alternative theory to explain them better, in some other way. That cannot be said to be done by the one put forward by Miss Haviland, viz., that the nest has arisen owing to the desire of the hen bird to shield her eggs from wet or damp,† for it does not explain them at all; and that, I think, is a sufficiently destructive criticism, since it is the function of a true hypothesis to explain all facts that are relevant to the issue, and facts which have a strong appearance of being relevant to the issue—as those I have adduced most certainly have—must be deemed to be so until they are shown not to be. Independently, however, of this objection, the view here advanced is, I believe, untenable, for the three following reasons: (1) Because the drastic methods of nature must, far more efficiently and in a far shorter time, have brought about the kind of protection required, through the constant remorseless weeding out of every individual bird or egg not strong enough to live and thrive under the ordinary conditions of its environment (which, by the way, include tepid

\* 'Zoologist,' April, 1902, pp. 136-9; May, 1902, pp. 196-7; June, 1906, pp. 201-4, 209-10, 212. The 'Scottish Naturalist' ("The Display of the Mallard," S. E. Brock), p. 80.

† 'Zoologist,' p. 244.

water in the case of an incubating Grebe's eggs):\* (2) because the demand here made upon avine intelligence is altogether too great: and (3) because the supposed effects, on a general review, are not in harmony with the supposed cause. I may here point out that if a bird only modifies, however intelligently, the existing structure of a nest, however rude, it does not thus originate such structure. To do that, it must, for the first time, make use of a stick, stalk, stone, etc. Of course, when structure had once begun, beneficial variations in it, from whatever cause arising, would be taken advantage of by natural selection without prejudice to my theory which is only concerned with how it did begin.

Miss Haviland finds no difficulty in believing that the bird's nest was an outcome of bird intelligence. To achieve doubt, she should compare the nests and nesting habits of various species, for contradictions and irrelevancies would then swiftly accumulate. But, in place of reasoning, we have confession of faith, and no evidence is given; for the case of the Dunlin that, when her nesting hollow was flooded during the night, "collected a rim of bents a quarter of an inch high" (which is not very high) "round her breast"† is, as it stands, none. Where are the details? Were the bird's actions, "during the night," observed? A flood must, almost certainly, involve some motion of the water, even if slight, in one direction rather than another, so that some of these bents, if not all, might easily have floated against the bird's breast, the very fact of which might well have brought its instinctive activities into play. The facts, as given, establish nothing, but upon them we have the usual question-begging comment: "She did not grasp the necessity of raising the eggs themselves out of the wet, and, consequently, both she and they were still lying in the water, but, in her futile attempts to protect them and herself from the damp ground, do we not see, etc.?"‡ In short the bird *did* nothing effective, and Miss Haviland *assumes* that she meant to.

\* That the shell is the natural shield of the egg seems to have been quite overlooked by Miss Haviland.

† 'Zoologist,' p. 224.

‡ *Ibid.*, p. 224.

Those acts without result, merely, must be proved to have been attempts to produce the result supposed to have been intelligently wished for, before we are justified in seeing anything that might follow from this. The particular instance, therefore, breaks down, and, beyond it, there is only a form of general assurance which is no more than phraseology. "It is well known," says Miss Haviland, "that all nests undergo considerable repairs and structural alterations, when circumstances require it."\* This sounds very human, but my own observations have assured me that these so-called repairs are often undergone when circumstances do *not* require it, nor have I ever seen any act of the kind to which such terms seemed strictly applicable, or that could not be more probably explained as due to routine and the strength of the nidificatory instinct.

I quite agree that the idea that this instinct has originated in and grown out of the uncouth violence of what I have called the sexual frenzy, in birds, seems, at first sight, "in the highest degree fantastic," as Miss Haviland pronounces it to be. But the facts, also, which I have adduced in support of my views, may seem to offend in this way. My apology for them is that they exist, and, for my hypothesis, that it explains them, and therefore till another is forthcoming which explains them better (to do which it must first take note of them) it is entitled, fantastic-seeming or not, to rank as a provisional one.

Space only allows me to allude briefly to one or two other points. Miss Haviland says that the conduct of the birds under her observation differed in several particulars from what I have described.† I cannot, for my own part, find any essential difference in fact between our two records, but there is a good deal in interpretation of fact, which is perhaps what is meant. Miss Haviland, for instance, thinks that one part of the uncouth spring-tide actions of the male Peewit constitutes a genuine courting display. I, however, have not seen sufficient evidence that this is the case, nor do I find it in Miss Haviland's notes.‡ Checking these with my own,§ I believe that a wrong conclusion

\* 'Zoologist,' p. 224.

† *Ibid.*, p. 217.

‡ *Ibid.*, p. 219 (*d*).

§ *Ibid.*, April, 1902, pp. 136-7.

has been drawn from the premises. There is a test in this matter. True courting display action should, in the early spring, be the habitual causal prelude to pairing, but I have never once seen it so with the Peewit, nor does Miss Haviland state that she has. Miss Haviland writes as though she thought I considered these movements, *in toto*, to be ordinary display actions, whereas I was the first, I believe, to point out their true character. That was some sixteen years ago now, yet Miss Haviland, so far as I know, is the first endorser or partial endorser of the fact, which, however, by presenting us with a sequence, seems almost to show us the origin of courtship in birds. Again, Miss Haviland is inclined to think that Peewits have special places for their "amatory exercises," and says that if there were no distinction between these and their breeding haunts "this would afford considerable corroborative evidence for some of Mr. Selous' conclusions."\* I can certainly claim this corroborative evidence. The birds lay and "roll" over the same areas, and I have found the real nest, with eggs in it, at but a few paces from the "false" one, caused by the rolling of the male on that spot, as also witnessed by me.

Miss Haviland touches also upon another point of difference in our respective records, on which I might say something if I understood it better; but I am not sufficiently a grammarian. I know nothing about "the dogmatic tense," and the dogmatic mood (which might seem more germane to the matter) is not mine.

\* 'Zoologist,' p. 222.

## NOTES ON BIRDS SEEN DURING THE GALLIPOLI CAMPAIGN.

By D. A. J. BUXTON.

I HAD been intending to write a longer paper on the birds seen during the Gallipoli campaign, but Captain Boyd's paper\* covers nearly all my ground and a great deal more besides. So I will only add the few notes following.

COMMON WHEATEAR (*Saxicola oenanthe*).—A nest in a ruined farm on the West Krithia Road, on May 18th. The numbers of this species seemed greatly increased at Suvla and on Imbros in September, but very few, if any, stayed till the middle of October.

REDBREAST (*Erithacus rubecula*).—One seen on October 13th and one a day or two later, at Suvla, in the oak-scrub. They were very shy compared with English Robins.

SARDINIAN WARBLER (*Sylvia melanocephala*).—This bird was common in the oak scrub round the Gully all the summer, and at Suvla in September and October. Specially large numbers were present towards the end of October.

YELLOW-BROWED WARBLER (*Phylloscopus superciliosus*).—I am almost certain I identified this species in some walnuts near Morto Bay on May 2nd and in the scrub at Suvla on October 21st. On the latter date *Phylloscopi* of several species were very abundant.

GREAT TIT (*Parus major*).—Seen in the same walnuts as the *Phylloscopi* in May; not again till October 10th, at Suvla, in a

\* 'Zoologist,' vol. xx, April, 1916, p. 121.

large Turkey oak in the plain. Some of their notes struck me as unfamiliar, and their plumage as unusually bright, and tails as rather short.

BLUE TIT (*Parus cæruleus*).—Several brightly-coloured specimens were in the oak scrub at Suvla about October 20th.

GREAT GREY SHRIKE (*Lanius excubitor*).—Seen on May 12th on a thorn-bush on the West Krithia Road. *L. minor* and *L. collurio* arrived about that date. Immature specimens of the latter were common at Suvla at the end of August and throughout September. I saw one catch a large Hawk-Moth (probably *Chærocampa euphorbiæ*) at dusk on the wing and devour it in a tree near by.

SPOTTED FLYCATCHER (*Muscicapa grisola*).—Seen on May 5th at Helles; not again till September, when they were common about the camps on Suvla Plain, taking up their post at any point where flies were particularly bad.

SWALLOW (*Hirundo rustica*).—First seen at Mudros, in Lemnos, on April 18th, going north in numbers. Again, on May 11th and 12th, flying up the Aegean coast of Gallipoli (*i. e.* north-east) in a continuous stream all day. Ditto May 15th, 17th, 19th. This date seemed very late for northward migration still to be in progress. The only place where the Swallows seemed to nest was Sedd-ul-bahr (May 31st). Earlier in August they became commoner again, and were still inclined to travel north-east. Indeed, there never appeared to be any returning stream of migrants, at any rate before I came away, near the end of October.

SAND-MARTIN (*Cotile riparia*).—One appeared on May 1st and a few more on May 19th; not seen again.

BLACK-HEADED BUNTING (*Emberiza melanocephala*).—Small flocks (ten to twenty in number) of both sexes of these birds seemed to arrive May 6th–8th, frequenting the tracks and open ground. They soon paired off, and were then less conspicuous, particularly the females. The note of the male was often to be heard early in the summer, but they grew gradually scarcer, and I never saw or heard one after August 1st in the Gully.

CALANDRA LARK (*Melanocorypha calandra*).—My only definite record of this species is of a pair seen near "W" Beach on April 30th.

**DESERT LARK** (*Ammomanes* sp.)—I record this bird with much hesitation, as neither *A. deserti* nor *A. cinctura* seem to have been recorded from the neighbourhood of the Dardanelles. But, comparing the description I took down at the time with specimens of *Ammomanes*, I am quite clear in my own mind that it was this bird that I saw several times on sandy ground sparsely covered with shrub near the West Krithia Road on May 8th. It was very conspicuous, singing and hovering at no great height. I noticed that the primaries and tail were considerably darker than the rest of the plumage, but whether it was *A. deserti* or *A. cinctura* I cannot say: both species have a wide range in North Africa and Asia.

**RAVEN** (*Corvus corax*).—Very common on Imbros in September. A few at Suvla in October.

**SWIFT** (*Cypselus apus*).—Thirty or forty passed up the Gully (i. e. north-east) on June 1st; one on June 24th, and on August 9th.

**GREATER SPOTTED WOODPECKER** (*Dryobates major*).—The specimen that I saw in some tall elms in the middle of our ground at Helles on May 2nd and 18th was certainly this species, and not *D. lifordi*.

**COMMON BEE-EATER** (*Merops apiaster*).—A pair on the West Krithia Road on May 15th and 18th.

**HOOPOE** (*Upupa epops*).—Like Captain Boyd, I did not see this bird till August, in the Gully. I saw it again at Suvla in August, and on the hills of Imbros in September.

**GREAT SPOTTED CUCKOO** (*Coccycites glandarius*).—A pair on the West Krithia Road on May 8th and May 24th.

**RED-LEGGED FALCON** (*Falco vespertinus*).—A pair quarrelling with a family of Kestrels in a Turkey oak on Suvla Plain in September.

**CORMORANT** (*Phalacrocorax carbo*).—Mudros, April. One seen in the mouth of the Dardanelles during the landing on April 25th.

**TURTLE-DOVE** (*Turtur communis*).—On May 5th I saw a flock of twenty or thirty roosting together, but they must have paired soon afterwards. On July 15th I found a nest in a small thorn-bush, four feet up, containing a newly-hatched bird, dead. Another dead one was found the same day, just fledged.

**COMMON CRANE** (*Grus communis*)?—Large flocks of what I

took to be these birds migrated southwards over us at Suvla in October. They first appeared on October 13th and 14th, flying in huge flocks and very high, though their loud clanging note, which seemed as if it might be uttered in surprise on seeing Gallipoli so transformed, was very distinctly audible. They flew in a rough V-shaped formation, and usually came over us in the morning or evening. They were freely fired at, but I only heard of one being brought down, and that was at Anzac. Some more passed on October 20th and 21st, in smaller flocks, twenty to a hundred birds in each. I find that Captain Boyd took them all as Storks (*Ciconia alba*), and definitely identified some as such, though many flew too high to be identified, or came over at dusk. Referring to various books, I find that both species might have been migrating about that time, but cannot find any definite dates. The size of the flocks and their note make me still inclined to think that many were Cranes. It would be interesting if any one could give us any further information from previous experience or from birds brought down on Gallipoli, and so clear the matter up.

## THE STATUS OF THE BLACK REDSTART IN ENGLAND AS A BREEDING SPECIES.

By the Rev. F. C. R. JOURDAIN, M.A., M.B.O.U.

It is one of the many remarkable facts connected with migration, that though the breeding grounds of the Black Redstart (*Phoenicurus ochrurus gibraltariensis*) lie for the most part to the south of the British Isles, yet this species winters in fair numbers along our southern coast and the adjacent counties, and occurs on the spring passage every year in March and April, sometimes even in May. As it breeds freely on the other side of the Channel, it would not be very surprising to find it nesting in our south-eastern counties, but hitherto all the evidence of this has been extremely unsatisfactory.

Let us consider the supposed cases of breeding in chronological order.

The first statement to this effect was made by J. C. Bellamy, the author of the 'Natural History of South Devon' (1839), who asserted that it had been known to breed at Exeter. No further details are given, and the record was obviously not given on his own authority, so that in default of confirmation in more recent times, it may be passed over as far too vague to be accepted.

The next occurrence is, however, more definite.

John Hancock, in his 'Catalogue of the Birds of Northumberland and Durham,' (1874), after describing this species as an "extremely rare" Spring and Autumn migrant, states that a

pair nested in a garden in the city of Durham in 1845, and that the nest and one of the eggs passed into his possession. Nothing is said here as to whether the eggs were authenticated in any way, but the late Canon Tristram, writing sixty years after the event, gives some additional particulars. The nest is said to have been built 'on a cherry tree trained on a wall'—an unusual site for a bird which nests in holes; and the birds are also stated to have been shot: the male being in the Durham Museum. ('Victoria History of the County of Durham,' I, p. 178.) If these additional particulars, written after so long an interval, can be trusted, and the male in the Durham Museum can be traced and shown to be the bird in question, this case may be said to be substantiated. It is curious, however, that no mention is made of it by Professor Newton in the fourth edition of 'Yarrell,' as it certainly seems to have rather better claims to recognition than any of the others. It must, however, be remembered that Durham is considerably further north than any known breeding place of this species, and that its occurrences as a passage migrant are extremely few. Mr. A. G. More ('Ibis,' 1865, p. 22) says that Mr. J. Tracy includes it in his list as having nested in Pembrokeshire, but on referring to Mr. Tracy's paper ('Zoologist' 1850, p. 2641) I find it recorded as a 'very rare' autumn visitor, of which two occurrences only are noted.

On May 8th, 1852, two boys, while birds-nesting at Longdon,\* near Rugeley, Staffs., found a nest in a heap of thorns lying near a hedge, containing four white eggs, which they took to Mr. R. W. Hawkins. In this case the parents were not identified in any way, but from the appearance of the eggs, Mr. Hawkins came to the conclusion that they were probably Black Redstart's. He does not, however, assert this positively, but says "If not the eggs of the Black Redstart, what are they?" The nest and an egg were subsequently sent by Mr. Hawkins to the Rev. F. O. Morris, and were actually figured by him in his 'Natural History of the Nest and Eggs of British Birds,' Part 26 (p. 58) as the eggs of the Black Redstart! To anyone familiar with the nesting-habits of this species the site described would alone be enough

\* Misprinted as 'Rongdon' in the 'Zool.' 1852, p. 3503: and also in the fourth edition of 'Yarrell' I, p. 334 and the 'Ibis.' 1865, p. 21. This shows the necessity of correcting misprints in order to avoid repetition of error.

to discredit the supposition. Possibly the eggs were the very rare white variety of the Hedge-sparrow's egg: the site would be a very likely one for this species. In any case there is nothing to connect them with the Black Redstart, except a statement subsequently made by Hawkins to William Hewitson that "a respectable person in his neighbourhood" had seen a pair of birds the male of which he described as resembling a Black Redstart, nesting in a wall, and that the eggs were white (Col. Illustr. Vol. 1. p. 106).

An even more extraordinary statement was made by W. J. Sterland, in his little book on the 'Birds of Sherwood Forest' (p. 67), who believed that he had found this species on three occasions in Nottinghamshire nesting in hedgerows! and who took in May 1854 four white eggs, one of which afterwards was passed into Professor Newton's collection. In the 'Ootheca Wolleyana' I. p. 308. the professor stated his belief that these eggs were really those of the Blackcap. From the position of the nest it is impossible that Sterland could have had a good view of the bird, and his description of the nests would pass for those of the Blackcap. Of this record we may say in Seeböhm's words that "the position of the nest in a hedge almost amounts to proof that he was mistaken in his identification."

In 1858 Mr. G. Kirkpatrick found a nest with five white eggs on a patch of waste moor at Duncow, near Dumfries. The nest is said to have been like a Yellow-hammer's, but larger (See 'Birds of the West of Scotland,' p. 85). There seems to be no reason for supposing that these eggs were anything but white varieties of Yellow-hammer's eggs, and it is remarkable that on the same piece of waste ground Mr. R. Service found on June 16th, 1886, a nest of the Yellow-hammer with three eggs, two of which were practically pure white, while the third had only some very faint speckles (see H. S. Gladstone's 'Birds of Dumfriesshire,' p. 14). The only noticeable difference between the descriptions of the two clutches is that those found by Mr. Kirkpatrick were 'shiny,' while Mr Service's eggs were without gloss. The extreme improbability of the Black Redstart breeding here is emphasized by the fact that no specimen of the Black Redstart has ever been obtained in the county.

Coming to more recent times we find in the 'Zoologist' for

1888, Mr. W. Ogilvie Grant writing that the British Natural History Museum had received, "an interesting acquisition in the shape of an undoubted nest with two eggs of the Black Redstart, *Ruticilla tithys*, taken in Essex. This is the first authentic instance, I believe, which has been recorded of this bird breeding in England." A description of the nest, which was built in a hole of an ivy-covered tree and originally contained four white eggs, follows. The sitting bird is described by the lady who presented the nest as "a dark-coloured bird with a red tail" and this is apparently the sole justification for describing the occurrence as "authentic." Finally Mr. Grant expresses his intention of exhibiting this "most interesting nest and eggs" at the next meeting of the Zoological Society.

I cannot, however, find any record of this having been done, perhaps because Mr. Miller Christy, who carefully inspected the nest and eggs not long afterwards, found them to be undoubtedly those of the Common Redbreast! See the 'Zoologist' 1888. p. 157, when it is suggested that the bird seen may have been an ordinary Redstart nesting near; but from my own experience of a somewhat similar case (which however did not find its way into print) I am inclined to think that it was merely the hen Redbreast, hastily seen by credulous and untrained observers. No notice of the eggs appears in the 'Catalogue of the Eggs' in the British Museum, Vol. 4, so we may presume that the authorities of the British Museum have dispensed with Mr. Grant's "interesting acquisition."

In 1890 Mr. W. Oxenden Hammond reported in the 'Zoologist' (p. 220) a second supposed instance of breeding in Dumfriesshire. In this case the nest was found by a lady in a stone "dyke," so that the site was not unlikely; but as the ground was worked over during that season by no fewer than three experienced field-naturalists, two of whom were resident in the neighbourhood, and all of whom refused to accept the record, there seems no doubt that it was due to the observer mistaking the Common Redstart for the rarer species (cf. 'Birds of Dumfriesshire,' p. 15). Mr. Service adds that on two occasions he has been sent for to see supposed Black Redstarts' nests, but both turned out to be the ordinary species.

Up to the present year then, it may be definitely stated that

there has been *no authenticated instance of the Black Redstart breeding in the British Isles*, with the possible exception of Hancock's record from Durham in 1845, which, however, requires confirmation before it can possibly be accepted. It was therefore with considerable surprise that I read in the 'Zoologist' for 1916, p. 237, a note from Mr. N. Orde Powlett, in which he records the finding of a nest in a tin in a rubbish heap in the middle of a field! This is not an unlikely site for a Redbreast's nest, but so improbable for that of the Black Redstart that in itself it is enough to discredit the record. But when it is added that the finder did not notice the birds at all, and Mr. Orde Powlett did not go to the place till the day after, when the eggs were broken and the nest occupied by a Toad, it makes the confidence of the recorder even more remarkable. The Black Redstart, although it frequently nests in outbuildings and sheds, is remarkably wary, and like the Pied Wagtail, unwilling to give away the site of its nest. Why these birds should have continued to stay in the neighbourhood of their ruined nest, is difficult to suggest, even supposing we grant that they were correctly identified. Nothing is said about any second attempt to breed in 1915, though this is the only cause which could have induced the birds to stay there.

Personally I am inclined to believe that the nest was that of the Robin, but it has been suggested that possibly the birds seen had escaped from captivity. This is rendered more probable by the fact that this species has bred in Mr. W. E. Teschemaker's aviaries in Devonshire. Cage birds might possibly allow identification at close quarters in this way, but I see no reason whatever for believing that the bird which laid the eggs in the tin was a wild Black Redstart. It would be interesting to hear the report of some expert on the eggs, which there is every reason to believe will prove to be the white variety of our Common Robin. I should not have written at such length on this subject, but when a record has been allowed to stand unchallenged in print, it is difficult at a future time to prove its worthlessness, and in this case it is necessary that attention should be drawn to the extreme improbability of its correctness at once, in order to avoid the perpetuation of error.

## A CONTRIBUTION TO THE LIFE-HISTORY OF THE HERRING-GULL.

By ERIC B. DUNLOP.

ON April 14th, 1915, I arrived at the locality on one of the Lakes of Central Canada, where the following observations were made, travelling over the ice by dog-sleigh. Owing to the warm weather of the previous ten days the ice was already weakening ; in fact, the exceptionally early spring weather had caused small patches of open water to show amid the ice in the vicinity of the islands, the current flowing between them wearing the ice away more rapidly than on the open lake.

On going out to an islet, I found that there were many Herring-Gulls (*Larus argentatus*) there ; a fur-trapper (a careful observer) who had been in the vicinity for the previous month, and whom I had previously asked to note the arrival of the Gulls, saw the first two birds at this islet on April 6th.

On April 16th there appeared to have been a considerable accession to the numbers of the Gulls during the day ; and up to 10 p.m., if not later, they were making a great noise, calling continuously.

On visiting the islet on April 20th, it was found that the Gulls in some few cases were scratching a hollow out for their nests, and in some of the hollows pieces of vegetation had been placed. This was the last day I was able to reach the Gulls' breeding-place over the ice.

On the 23rd, after some trouble in breaking a passage through the ice, the islet was reached in the skiff, which I had taken out to my camp on a large island by dog-train. On reaching the island I spent some time hidden in a shelter which had been previously erected, but the Gulls left and sat out on the ice, and did not return. The nest-hollows were little different from what they were on the 20th.

On April 25th, a mild day, Double-crested Cormorants (*Phalacrocorax auritus*), which breed on the islet, stayed the night for the first time, though they had visited it on various occasions previously. Probably it was the arrival of the Cormorants for the summer that perturbed the Gulls; whatever the cause, they were greatly excited, and left the place after dark in a body; the concourse, keeping up a continual calling, settled on the water. They kept up their calling most of the night, rising from the water now and again, only to drop down at a fresh place. For several evenings after this they were noted coming in in flocks at dusk, no doubt having been away foraging, though there were always a considerable number of Gulls at the islet; they kept up a continuous clamour, after their arrival in the evenings, up till 11 p.m., and how much later I cannot say.

On April 29th some of the nests had been nearly completed, and on May 2nd many of them appeared to be ready for eggs. On May 4th the Gulls were watched for some time from the blind. No eggs had yet been laid. The birds were standing by their empty nests in pairs. On the 6th they were again standing or lying down near their nests, basking in the sun and preening their feathers, or dozing with their heads under their scapulars. One pair was noted *in coitu*. There were no eggs as yet. I saw many pairs indulging in a curious performance; they stood face to face or side by side, and then jerked their heads upwards rather quickly until their beaks pointed towards the sky, then resuming the normal pose, repeating this time after time in quick succession. The motion was made alternately or in unison; with each uplift of the head a low not unmusical call was uttered. On this and other occasions it was noted that the upward lift of the head varied in extent; sometimes the head and beak were only slightly uptilted, at others the head was jerked up until the beak pointed directly upwards. I saw one pair standing together

on a boulder engaged in this performance ; they descended to the ground, then the bird I took to be the female continued the action very vigorously, and pecked several times at the male's beak, when he eventually regurgitated some food which the female at once swallowed. She then immediately reascended the boulder. The hen Gull which I saw *in coitu*, immediately the act was over, commenced to jerk and to utter the subdued note, but the male did not reply in like manner, nor did he feed her. The islet was next visited on May 8th. Two nests now contained single eggs, eighteen days after the commencement of nest-making was first noted ; one of these eggs was close to where I saw the birds *in coitu* on the 6th, and doubtless belonged to that pair ; this nest eventually held three eggs, one of which was chipped on June 5th. It must be noted, however, that it is frequently several days subsequent to the first springing of the shell that the chick gets clear of the egg. After watching from the blind (my companion having left in the boat) a short time, one of the birds belonging to the nest near which the nuptial act was noted on the 6th, settled and stood about 10 ft. from the nest. A Crow (*Corvus brachyrhynchus*) then settled near by ; he made a sudden swoop down towards the nest, and the Gull rushed forward with upraised wings and drove him off ; the mate of the Gull also came up and assisted in driving off the would-be thief. After a while the Crow returned and flew past. One of the Gulls ran forward as fast as it could and sat down on the egg ; the bird had retired a few feet from the nest and stood there after the first raid. Now it sat on the nest awhile and then returned to its former stance. Again the Crow flew over, and again the Gull ran forward and sat on the egg. The Crow then alighted in front of the nest, and its mate flew up and settled behind. The Gull was very uneasy, calling continually, and a raid on the egg was no doubt intended, but the sitting Gull's mate rushed at one of the Crows with upraised wings and put him to instant flight ; the other Crow was also driven off. The Gull continued to incubate the egg for most of the afternoon, though it left it for a short time now and again and sat near the nest. Another pair was observed engaged in the feeding ceremony. The female pecked at the male's beak and then at the ground, indicating thus, it seemed, in dumb show,

that she wished to be fed; both uttered the subdued note and jerked their heads upwards. The male eventually disgorged some food, after running a few feet to one side. This the hen devoured. Then both jerked repeatedly and the hen ran crouching round the cock. He mounted her, and had four or five separate connections before dismounting. It may here be noted that when the head is jerked upwards the subdued note is always uttered too, and that this ceremony is often indulged in without feeding or coition following. Indeed, in about 50 per cent. of the cases noted nothing further ensued. Another pair acted as follows: A male Gull was calling with wide open mouth; his mate was standing near, and, stimulated apparently by the sight of his open mouth, ran up and without any preliminary jerking pecked at the male's beak; she also pecked at the ground. She kept this up without cessation for a full two minutes; the cock then ran a few feet to one side, disgorging a considerable quantity of food on to the ground. Up till then there was no jerking or subdued calling. After the hen had eaten the disgorged food the male commenced jerking and uttering the subdued note; the female replied in a similar manner, and again pecked at the male's beak with no result. The cock then mounted the hen, and coition ensued. The male took the lead in the jerking ceremony, and these and subsequent observations suggest that when the ceremony is initiated by the female she desires food, whereas when the male takes the initiative he is desirous of coition.

In another case noted on this day, coition ensued after the head-jerking ceremony, and several cases were noted of the hen being fed by the male regurgitating food subsequent to the ceremony.

Another form of ceremony was observed to-day and on other occasions. It was as follows: A bird flew in and settled near another; both then commenced bowing their heads up and down, the heads being bent towards the ground all the time, the beak pointing directly towards it; they walked round meanwhile, uttering a note which may perhaps be compared to the "cluck" of a domestic fowl. (The manœuvres of the birds reminded me of Oyster-catchers (*Hæmatopus ostralegus*) when the males are following a female, bobbing their bent heads up and down and

piping). The female was subsequently fed by the male by regurgitation.

I saw several instances of this ceremony, and in more than one case one of the birds bobbed the head until the motion was taken up by the body, and eventually the bird lay flat on the ground on its belly; it then worked the tail from side to side, much in the manner of a male when treading. The meaning of this ceremony is not clear to me, but it undoubtedly has a strong sexual significance.

Having put up a blind on another island, I spent some hours watching the Gulls there on May 14th. The first nest under observation here contained one egg on May 12th and held two on the 14th. After the boat left, one of the Gulls stood near this nest for some time; two Crows then came along, and the bird at once covered the eggs, incubating them. It sat some time and then left the eggs, and was apparently fed by its mate after the jerking ceremony had been gone through; it then returned and incubated. This nest subsequently held three eggs.

The second nest under observation here was empty on the 12th, and held one egg on this day (14th). One of the Gulls, after standing near the nest for some time after the boat left, sat on the egg; it left for a minute or so more than once, but soon returned. Its mate came and stood near. The sitting bird left the nest and indulged in the head-jerking ceremony with no result; it then returned to the nest and incubated. Later the same bird was incubating when [the other approached, and lowering its head, uttered the challenge call. The incubating bird at once rose and ran to the other; both then uttered the call, not unlike the clucking of a hen, previously mentioned, and bobbed their heads up and down. The bird which had not been sitting then went to the nest and egg and partially covered them for a few seconds. It then went off, and the bird which had been incubating all the afternoon mounted it and copulation ensued; evidently it was the male that was taking the major share of the incubating duties at this stage. Shortly after a Crow flew near once or twice; the male uttered an agitated call (evidently disturbed by the proximity of the Crow to the egg), and immediately went to the nest and resumed incubation. Later it left the nest and preened its plumage; it approached

the other, and went through the jerking ceremony without result. The other bird now uttered a low deep note which might perhaps be written as "kerr," and went on to the nest and incubated; later a disturbance among the Gulls sent both off in flight. An interesting point which I have been unable to decide, but which is worthy of attention is, does the hen ever feed the cock by regurgitation when he has been taking the chief share in incubation and has been on the nest for a considerable length of time? It certainly appeared in this instance as though the bird which mounted the other was applying for food when the jerking ceremony was subsequently gone through. On May 16th these nests were again kept under observation. At the first nest, soon after the boat left, one of the birds commenced incubation; a little later its mate came up and uttered the call which has been termed by Strong and others the "challenge." The sitting bird at once left the nest and the other walked on and incubated the eggs. Later this bird went off; a Crow settled near, both the Gulls at once flew to the vicinity of the nest, and one of them soon went on. The Crow approached the nest more nearly, the non-incubating bird at once flew up and drove the intruder off. It was noted on various occasions that when a Gull's eggs were threatened by Crows the non-incubating bird always hastened to the assistance of the sitting bird. With regard to the second nest referred to on the 14th, it contained two eggs when I entered the blind at 2 p.m. this day (16th). One of the Gulls soon settled near it and stood there a little while. On a Crow flying past the bird went to the nest and settled down on it. Subsequently it went off, but a Crow flying over caused it to run on again. The Gull called in an agitated manner whilst the Crow was about. After one-and-a-half hours the sexes changed on the nest, without ceremony. The bird on the nest appeared to take the initiative and walked off, the other, uttering a few guttural sounds, going on. This bird remained on for the last hour and a half I was there. The non-sitting bird in both cases always stood near at hand.

This nest, as previously noted, contained two eggs at 2 p.m.; when I left at 5 p.m. it held three. At about 4.30 p.m. I noticed that the sitting bird was very restless, and I have no doubt that it was the second bird to go on that laid the egg. Another nest

near by that contained one egg at 2 p.m. held two at 5 p.m. The eggs appear to be laid every other day, as a general rule, but there is some variation in this respect, for the interval may be longer or shorter. It may here be noted that a male Gull shot on June 12th showed a large incubation-patch, proof that the males undertake their full share of the incubatory duties.

As has been shown in this record of observations, both sexes incubate from the laying of the first egg. The following are the particulars of the hatching-out of four clutches of Herring Gulls' eggs.

I. Three eggs.	<i>June 23rd.</i>	One young one out and dry, one egg chipped, one unchipped.
	<i>,, 24th.</i>	No change.
	<i>,, 25th.</i>	Second out; third did not hatch.
II. Two eggs.	<i>,, 26th.</i>	One well chipped, one slightly.
	<i>,, 27th.</i>	No change.
	<i>,, 28th.</i>	One out.
	<i>,, 29th.</i>	No change.
	<i>,, 30th.</i>	Second out.
III. Three eggs.	<i>,, 25th.</i>	One chipped.
	<i>,, 26th.</i>	Two out; third chipped.
	<i>,, 27th.</i>	Third out.
IV. Two eggs.	<i>,, 26th.</i>	One just out; one chipped.
	<i>,, 27th.</i>	No change.
	<i>,, 28th.</i>	No change.
	<i>,, 29th.</i>	Second out.

The shells of hatched eggs are commonly left lying within a few yards of the nest. The Herring-Gull does not void the faeces from the nest. The Kittiwake is the only Gull with which I am acquainted that habitually does so.

On May 17th two birds were seen jerking their heads and uttering the subdued call, not close together as usual, but one on the island and one on a stone in the water 10 yards away. On another occasion I saw a Gull swimming on the lake going through the jerking ceremony, but its mate on the water by it did not respond. It appears to be unusual for the ceremony to be gone through unless the birds are standing close together on land. In one instance two Gulls were seen together, one of which was uttering the subdued note and jerking; the other brought

up food which the first took, some of it from its mate's mouth before it reached the ground. Usually both sexes utter the subdued note, one replying to the other, but occasionally the solicited one does not reply, as in this instance. One of these Gulls was observed to pick up a piece of nesting-material and commence the jerking and calling ceremony with it in its beak. Both birds of a pair were also seen carrying nesting-material, though the actual nest-making was not witnessed; no doubt both sexes take their part in this work.

The last date on which I watched the Herring-Gulls was June 17th. Young had been out for some little time. The clucking note was still to be heard and also the subdued note. The latter call consists either of a single squeak or is double-noted, and may perhaps be written as "oo-ee," the second note being higher pitched than the first; occasionally a third note is uttered. This call is not unlike the squeak of the young when calling for food or shelter, and is probably derived from it, for the female uses this call and accompanying jerking ceremony when desiring food from the male. We may compare the behaviour of the Gull to that of the female European Rook, for on the arrival at the nest of the male with food she utters a call resembling that of the young, and flaps her wings in a manner similar to that of the fledgling Rooks when being fed. The reversion to the manners of youth is not an unusual phenomenon during the breeding-season of animals. Young Gulls which disperse on the approach of humans return to the nest as soon as quiet is restored, and so are easily found by their parents.

With regard to the feeding of its mate by regurgitation in the case of the Herring-Gull, it may be noted that this is not the only Gull I have seen to act thus; the Ring-billed Gull (*Larus delawarensis*) was also noted feeding its mate in this manner after the eggs had been laid. It may be noted that I have watched the Common Tern fishing assiduously for his mate before egg-laying had commenced, the female sitting for hours on a stone in the water, whilst the male flew up and down seeking to secure a meal for his lady-love; whenever a catch was made he at once flew straight to his mate and delivered the fish into her beak. This I have observed on various occasions.

The records of Gulls immediately covering their eggs and

incubating on the approach of Crows, appear to me to be proof that the incubating from the first egg in this (and also many other) species is a protective habit, which preserves the eggs. This I have previously endeavoured to make clear (*cf.* 'British Birds,' vol. iv, pp. 137-45; vol. v, pp. 322-27; vol. vii, pp. 105-14).

That selection is close was obvious, for the Crows succeeded in taking Gulls' eggs not infrequently.

## ORNITHOLOGICAL NOTES FROM SOUTH MAYO.

BY ROBERT F. RUTTLEDGE.

THIS spring, though a little late, was, however, much earlier than last year's, and migrants were observed nearly as early as in previous years.

The Willow-Wren arrived on April 4th, whereas last year it was not observed until April 22nd.

The following day Chiff-chaffs were singing, about a fortnight earlier than last year.

Nearly every evening White-fronted Geese were observed ; they are very numerous here in winter and in spring until the middle of April ; after that they appear in smaller numbers.

On April 8th my brother and I went to a bog-lake not far from here ; Black-headed Gulls were very numerous, as were also Common Gulls. We noticed three Ringed Plover on the muddy shore. On one side of the lake is a long stretch of shingle where the Ringed Plover built last year, and we therefore expected they would do so again this year. However, we searched in vain that day ; apparently they had not started to nest yet. Redshanks, Curlew, and Green Plover were about in numbers, and in the evening large flocks and some couples of Golden Plover began to sweep in and settle on the shores. At 7.20 p.m. Geese began to arrive ; a flock of forty-three flew down to the water about 15 ft. above our place of concealment,

giving us an excellent view of their white foreheads and of their plumage. During the course of the evening many arrived, and we saw some 154 in all.

On April 9th, a pair of Long-tailed Tits were discovered building.

Large numbers of Goldfinches were seen about the garden from April 10th to April 14th, and the paths were covered with Lesser Redpolls through the greater part of April. On April 11th and 14th, Jack Snipe were still in the bogs, and the last was observed on April 20th.

As usual, Redshanks and Teal were very conspicuous on all the bog-lakes, and Curlew were still in flocks on April 27th, though after that the flocks began to break up into couples.

From April 18th onwards we spent nearly every evening trying to discover out of what woods some Woodcock were coming, as we were sure they were nesting.

Every evening they would suddenly appear, flying up and down certain woods uttering the curious "croak" repeated three times and then followed by a "squeak."

One evening, while we were waiting, one circled round and settled on a marshy spot eleven yards away; it was dusk, and the bird was not easy to see, but its breast showed up well as it fed and moved about. It remained there for about half an hour.

The 19th found us watching them again; three were seen at one time and from now every evening they performed just the same flights. On some occasions the bird flew so low overhead that the throat could be seen to quiver when it uttered the notes. I may say that these birds occupied our attention every evening until the end of April, when, after investigating different woods, etc., we abandoned the search for their "rising-place." Anyway, it seems certain that they nest here fairly numerously, but this is, of course, no uncommon occurrence.

The weather, up to this, had been harsh, but the 20th was a glorious day and new life was in all the birds, which were singing heartily, and many were busy building. The woods swarmed with Chiffchaffs and Willow-Wrens, all singing loudly.

Sand-Martins were first noticed on April 20th.

While looking for a Water-Rail's nest on the afternoon of the

20th I found a Snipe's nest containing eggs. Snipe nest commonly on the bogs, and the males "drum" incessantly all day and all night; they also utter their other two notes while in the air and on the ground.

The first Swallow appeared on April 22nd, which is the same date as its arrival last year.

After being absent for a little time, Redpolls were again very numerous on April 24th.

On April 25th we cycled to the northern end of Lough Carra; the first find was a Redshanks' nest with eggs, on a bog which we crossed on the way; here we also found Green Plover nesting. In a bay below Moore Hall a pair of Great Crested Grebes were feeding; they are fairly numerous on the lake.

Tufted Duck were to be seen in most of the bays, and Mallard were very numerous.

Derrinrush, a long peninsula, is a paradise for Warblers, being densely covered with natural timber growth. At one spot, on the way back, we noticed Sand-Martins innumerable, and we saw the first Swift.

Round the coasts several Water-Rails were put up.

Corncrakes were first heard on April 26th.

On April 27th House-Martins were seen early in the morning, and they went straight to the old nests. These birds are far more plentiful this year than I have ever seen them at this place.

The Cuckoo was first heard on April 27th (this is the third year running it has arrived on this date).

In the afternoon of the 27th we again visited the bog-lake where the Ringed Plover nest; this time we observed four and later found a nest with four eggs. Along with flocks of Curlew there were many Whimbrels; in some cases they mixed with the Curlew and sometimes were in flocks by themselves. Whimbrels were numerous over the bogs for about a fortnight after this.

April 29th was spent visiting the islands of Lough Carra.\* It was rather early for the nests of some species, but we found some Wild Ducks' nests and a colony of nesting Common Gulls; Tufted Duck were numerous, as were also Common Sandpipers.

\* 'Irish Naturalist,' vol. xxv, pp. 96, 97.

A few Terns were about ; they nest on one island in the lake. The last White-fronted Geese were seen that day.

Corncrakes were now numerous, far more so than I have seen them for about six years ; they might be seen and heard in the hayfields every evening.

A little way from here, on May 3rd, a Sedge-Warbler was singing, and from this date they might be heard every day.

The next day we set off to the northern end of Lough Mask. On the way we found a colony of Sand-Martins nesting in the sides of a raised road across a bog ; there is a great scarcity of sand-pits in the country, and it is not uncommon for Sand-Martins to nest in turf banks (see Ussher's 'List of Irish Birds,' p. 17).

In the hills near Lough Mask birds were extraordinarily scarce—only a few Meadow-Pipits and Cuckoos ; in one bay we saw a pair of Red-breasted Mergansers, and Common Sandpipers were about the shores.

An arm of the lake goes back into the country like a river and then forms a small lake : here there were no less than eighteen Mute Swans ; also a few Terns and a flock of Curlew along with some Whimbrels.

Finches were to be found in flocks on the newly sown oats at the end of the first week of May, nearly all having deserted the yards.

On May 11th, after half an hour's search, we found three young Redshanks, which could not have been hatched many days.

An interesting record is that of the occurrence of a Nightjar at the Blackrock. It landed there exhausted in October last and died in a few days.

A pure white Curlew was shot by a local fowler last winter.

## NOTES AND QUERIES.

## MAMMALIA.

**Rats and Eggs.**—The correspondence on this question in the 'Zoologist' has been interesting. I have in two or three episodes in my career been much worried by the doings of the Brown Rat (*Mus decumanus*). When managing a small zoo in Lancashire in the early '80's, I found the grounds, to start with, riddled with their burrows, the sides of a small lake being honeycombed. I never recovered any eggs laid by the waterfowl, and placed it to the charge of these animals, until I had reasons to suspect the gardeners (!). They burrowed into my pheasantries, whither they came primarily for corn—I often found pheasant eggs, of various species, half covered by the burrowings of the previous night; I never saw a broken one, nor empty shells. My predecessor had allowed even the keeper's house to be absolutely undermined, as well as bird-rooms and monkey-house. I at length gave up in despair. Black Rats (*Mus rattus*) have for years been a great pest in the local grocers' warehouses, in maltings, fish-houses, etc. They will literally burrow into date-boxes, and lick out jam-pots, but never has any grocer been able to assure me that they interfered much with eggs, although one informed me that he had on one occasion, when taking up some floor-boards, discovered several unbroken eggs of an unknown date on the outside of a nest of Rats. In no single instance could a grocer recall an egg broken by them.—A. H. PATTERSON (Great Yarmouth).

**Do Rats Eat the Eggs of Poultry?**—Referring to Dr. Laver's inquiry (*ante*, p. 395), the Rats which infest my poultry-runs alluded to in my communication (*ante*, p. 352) are certainly the Norway Rat and not the Water-Vole. I question whether the latter species occurs within a quarter of a mile from where I keep my poultry, certainly not in large numbers. What attracts the Norway Rat to the wood where I keep my hens, no doubt is largely the refuse which is put into the stream from the fish-shop higher up the valley. I should not like Dr. Laver to suppose that because the Rats on my run are not guilty of eating eggs, therefore Rats in other districts are equally immune from this proclivity. In the area to which my note refers, this immunity may be ascribed to the abundance of more suitable food. Whatever may be the reason, I have never once in four years found any egg-shells in or about my hen-cotes. I need hardly say

that animals, using the term in its widest sense, when pressed with hunger, will eat almost anything.—E. P. BUTTERFIELD (Wilsden).

**Nesting of Rats and a Sequel.**—The following incident, which might have terminated in serious consequences, took place in Bedfordshire a few years ago. A payment of £20 was to have been made to an illiterate person to whom the knowledge of payment by cheque was limited so that cash was preferred. As the man failed to call for the money as arranged, it was wrapped up in a piece of newspaper and hidden away in some wood, in the manger of an old stable which was then serving as a workshop. A day or so following, the employer had occasion to take away half a sovereign from this amount, and in so doing possibly revealed the hiding-place to a man who was employed by him in that workshop. When the money was required, about a week afterwards, it was missing, and suspicion naturally fell upon the man who was the only person that had access to this particular part of the premises. This was supported further when soon afterwards the man left his employment and after taking a holiday at the seaside, then purchased tools, etc., and set up in business on his own account. The venture proved unsuccessful and once again the man was offered employment, provided he could give a satisfactory account of where the money came from with which he had commenced his former business, and show that he had had no hand in the removal of the missing gold. The explanation was given that the money was loaned to him by a sister, and he requested his former employer to interview her. For various reasons, and partly from the wish not to bring in a third party, this course was not pursued and the man was eventually reinstated. When I personally raised the question of the wisdom of such an action with the employer, he remarked: "Perhaps it is better to employ a man one suspects is dishonest, and keep temptation out of his way, than take another one knows less about." In the meantime the business, excepting this one workshop, had been removed to another part of the town. Some twelve months later this man went to see his employer, and took with him £9 10s. in loose gold which he had found in some rubbish that Rats had scratched out between the timber stacked upon the earthen floor. The following morning all the timber was removed, the accumulation of rubbish sifted, and the remaining £10 recovered; the explanation, of course, being that the newspaper in which the money was wrapped had been dragged away some 20 ft. distant along the manger and been used for nesting purposes in the meantime, and afterwards displaced, with the gold, by renewed burrowings of these or other Rats.—J. STEELE ELLIOTT.

## AVES.

**Migration in Bedfordshire.**—In a recent note to the 'Zoologist' (p. 314) I wrote of the migrant bird-life frequenting the Bedford Sewerage Farm at Newnham, which is situated in the adjoining parish of Goldington. Reference was also made to the present existing open sewage conditions that are being replaced by septic tank principles, which changes have been delayed in completion until the war is over. When these are in readiness the present 100 acres or so of attractive feeding-grounds will be no more, and many of the rarer spring and autumn migrants will pass over unheeded and probably hardly credited in years to come. From the latter end of July to the end of September practically hardly a day passes but one can see at least some migrant of interest that may throw a little more light on the subject of this flight-line that passes along the Ouse valley. A recent visit to this locality gives a fair indication of what birds may be met with in a county so far remote from the coast-line movements. On September 1st I visited the farm in the evening, but unfortunately not until darkness was coming on, and the failing light prevented my making any prolonged observations. A Curlew was most conspicuous by its noisy callings and wary movements, and a solitary Dunlin, still in the breeding plumage, could be seen with the aid of field-glasses; but three other smaller waders, although within twenty yards, could not be satisfactorily identified. Several Green Sandpipers were calling frequently, and a large number of Snipe were "scaping" freely around wherever I wandered. Two Tufted Duck were swimming on a pool of drainage water in a disused gravel pit. On September 3rd the following species were observed: 5 immature Sheld-Duck, 1 Tufted Duck, 5 Ring-Plover, 3 Greenshank, 1 Redshank, 2 Green Sandpipers, 4 Common Sandpipers, 1 Dunlin in winter plumage, and, in addition, fully 50 Snipe were observed (one of which was heard "drumming" for a short time), and the usual large number of Lapwings, Moorhens, Rooks, Jackdaws, Starlings, Pied and Yellow Wagtails, and a few Meadow Pipits, with the other more or less general bird-life found there practically throughout the year.—J. STEELE ELLIOTT.

**Stonechat near Wilsden, Yorks.**—As I was returning home from Bingley Wood on the afternoon of September 30th, I saw at a distance what I took to be a Whinchat; but on a nearer approach I saw it was a Stonechat, the very first I have ever seen alive in this immediate neighbourhood. It is not often seen here in the autumn, but is sometimes met with on migration on the high ground in early

- spring, but scarcely ever remains to breed.—E. P. BUTTERFIELD (Wilsden).

• **House-Martins' Nests usurped by House-Sparrows.**—Referring to my note (*ante*, p. 356) with regard to the usurpation by the House-Sparrow of the Martins' nests built on the south side of a public-house near here last summer, I asked the landlord this summer if the Martins returned this spring, and he replied that two pairs commenced to nest on the north side, but did not bring off their young; whether the nests were again appropriated by the Sparrows I was unable to ascertain. Of course a good many Martins' nests built in this village are never molested at all by Sparrows, but this may be, as remarked in the editorial footnote, because there may be sufficient nesting-sites for the Sparrows. As to Mr. Cocks's note (*ante*, p. 357) the nests of House-Martins here are built facing every point of the compass, and I quite agree with Mr. Cocks that architectural considerations have some influence in the selection of nesting-sites. Referring to the Rev. J. G. Wood's remarks, quoted by Mr. Cocks, it would be interesting to have the matter definitely settled, whether, of walls with a north-eastern or southern aspect, other things being equal, the former is the more favoured nesting-site of this species. My own impression is that if the eaves of a building projected considerably, so as to afford complete protection, the House-Martin would prefer to build its nest on a wall having a southern rather than a north-eastern aspect; but on this point I should not like to be dogmatic.—E. P. BUTTERFIELD.

**House-Martins and Sparrows.**—When I was a lad we had no end of nests of the House-Martin located in various parts of the town; they, for the greater part, built their nests facing north and east, although a number favoured opposite points of the compass. To-day these birds rarely put up a nest in the neighbourhood, having for the past few years been most unmercifully interfered with by the ever-increasing Sparrows. One can almost always discover when a nest has been usurped by the long loose straws depending from it. Only on one house do the Martins now yearly attempt to build, facing the east, but rarely does a pair succeed in keeping out the intruders. The use of sea-water for watering the streets and roads has discouraged others by the consequent want of tenacity and endurance of their mortar in prolonged moist weather.—A. H. PATTERSON (Great Yarmouth).

**Swallows Building in Chimneys.**—In three instances only have I met with the "Chimney" Swallow building in local chimneys. One

nest was located in a big old-fashioned stack that was in fairly constant use; the other two were built in two, half a mile apart, tall brick ventilation shafts erected over a main sewer, as evil-scented a selection as could be well imagined. These shafts have since been removed. The Swallows' local favourite nesting-places are the numerous pump-mills, steam- and wind-driven, dotted all over the vast spreading marshes, where the Yare, Waverley, and Bure meander among our East Coast lowlands. Cowsheds and barns are also largely used by this species. I have seen many nests in walls where bricks have crumbled away, and on beams, often on top, sometimes at the sides resting on big nails. On one occasion I saw a nest built on an inch-thick iron rail, shaped like a saucer, with dabs of clay on each side to shore it up safely as with brackets. Broken panes of glass are often the only means of in- and egress; whilst those birds building in boat-houses use the space between the water and the bottom of the doors.—ARTHUR H. PATTERSON.

## ANTHOZOA.

**Sagartia parasitica** Mounting on Solaster and Hyas.—It is well known that the commensal Sea-Anemone *Sagartia parasitica* will move freely from one empty shell to another in an aquarium, and probably many aquarium-keepers know that it is able to mount upon the shell of a passing Hermit-Crab, but I believe that no instance has so far been recorded of this Sea-Anemone mounting upon a passing Starfish. On May 25th, 1916, a Sun-Star (*Solaster papposus*) of 95 mm. in diameter was creeping slowly past an average-sized Sea-Anemone, attached to the side of a stone in an aquarium, when the Sea-Anemone quickly pressed its disc upon the Sun-Star, as it would have pressed it on the shell of a passing Hermit-Crab (see p. 39 of the present volume of the 'Zoologist'). The Sea-Anemone adhered to the Sun-Star and was actually dragged along the bed of the tank for several inches. The Sea-Anemone was then able to attach its base to a rock, and a short tug-of-war ensued between the Sun-Star and the Sea-Anemone, the latter eventually releasing its hold of the Sun-Star but remaining attached to the rock. The whole affair occupied only a few minutes. E. Howard Birchall mentioned in 1876 (in a note in the 'Zoologist,' vol. xxxiv, p. 5129) that *Sagartia parasitica* might "often" be found attached to the limbs of the Great Spider-Crab (*Maia squinado*). It would be interesting to know how often such specimens are observed. I have myself seen in a tank one of these Sea-Anemones firmly grasp with its base one leg of a large Common Spider-Crab (*Hyas araneus*) to which it remained attached.—H. N. MILLIGAN.

## NOTICES OF NEW BOOKS.

*Yorkshire's Contribution to Science.* By T. SHEPPARD, M.Sc., F.G.S., etc. London : A. Brown & Sons, Ltd. 1916. 5s. net.

In this neat volume of nearly 260 pages Mr. Sheppard has a great deal to tell us not only about Yorkshiremen in their relation to science, but other subjects of more general interest, for not only does he devote sections to a topographical review of Yorkshire publications, and to Yorkshire scientific magazines living and extinct, but he has a most interesting and valuable summary of general natural history journals, many of which, of course, are now things of the past—for extinction seems to be the usual fate of such ventures—and of the publications of scientific societies, including those dealing with geology and archæological matters. An index to these concludes the work, which begins with a bright presidential address by Mr. Sheppard to the Yorkshire Naturalists' Union. We note two important omissions in the list of journals not specially concerned with Yorkshire—no mention is made of the 'Avicultural Magazine' or of 'Bird Notes,' nor of the Avicultural Society and the Foreign Bird Club, by which they are respectively published ; yet these journals deserve attention if only for the beauty and utility of their coloured illustrations, to say nothing of their often including items of wide scientific interest. But this is but a slight blemish in a valuable and generally scholarly work.

*Growth in Length.* By RICHARD ASSHETON, M.A., Sc.D., F.R.S., Cambridge University Press. 1916. 2s. 6d. net.

The first part of this posthumous work has been prepared for publication by the author's widow, with the assistance of Professors Stanley Gardiner and J. P. Hill ; the figures, which number forty-two, are from the author's sketches. The sub-title is "Embryological Essays," and the first part of the book comprises three lectures given as one of the "Advanced Courses of Zoology" in the University of London, under the title of "The Growth in Length of the Vertebrate Embryo." The second part is a reprint of a paper on the "Mechanics of Gastrulation," which appeared in the 'Archiv für Entwicklungsmechanik der Organismen' in 1910 ; it will be particularly appreciated by those interested in embryology, because further copies are now unobtainable. A full bibliography is given, and the whole length of the work, which is well got up, is 104 pages.

